Effect of Yogic and Plyometric Training on Selected Physical, Physiological and Performance Variables Among Male Volleyball Players of Goa

A proposal submitted to Swami Ramanand Teerth Marathwada University, Nanded for the partial fulfilment of Doctor of Philosophy in Physical Education under the faculty of Physical Education

Researcher
MR. AARON AVELINO PEREIRA

Research Guide
DR. RAMESH KADAM

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड.

SCHOOL OF EDUCATIONAL SCIENCES
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY

NANDED
March 2022

INDEX

Sr. No.	Content	Page No
1	Introduction	3
2	Statement of the Problem	5
3	Review of Literature	6
4	Significance of the study	7
5	Objectives of the Study	8
6	Hypothesis	9
7	Limitation of the Study	9
8	Delimitation of the Study	10
9	Assumptions	10
10	Definition and Explanation of the terms	10
11	Method	11
12	Sampling : Population	12
13	Sample	12
14	Sampling technique	12
15	Design	15
16	Tools for Data Collection	16
17	Procedure	16
18	Statistical Tool	16
19	References	17

INTRODUCTION:

Volleyball is one of the most popular team sports in the world. In many countries, volleyball is the number one ranked indoor competitive sport. worldwide, it ranks third in the number of participants (Welch, 1966) In the United States, the game has always been popular, but it has experienced a tremendous growth in popularity since 1984 One indication of volleyball's success is it's increasing popularity in the school's physical education curriculum (Anthony, 1973) .With the sport's increased importance in the school's curriculum has come an increased need for evaluation tools of student performance.

The game of volleyball was invented by William G Morgan in the year 1895 in Holyoke, Massachusctts Y.M.C.A when Morgan went to Holyoke after leaving Spring Field School in 1894, where he found that many people didn't want to play basket ball. So a game is needed which is more recreational than anything else and involves more people. The game of volleyball was invented as a recreational game. At first a basket ball was used without a net throwing the ball from one group to another. The net was used at seven feet height since the basket ball was quite heavy, a ball made of soft cliff skin was used but it did not last long. The first demonstration of volleyball was given at Spring Field School in 1896. The rules were given by Morgan written in long hand. The first printed sales of the game appeared in the first hand book of Athlete League of Y.M.C.A. of North America in the year 1897. In this year, the game was taken all over the world through Y.M.C.A. J H Gray brought the game to India in the year 1920s. Y.M.C.A. College of Physical Education, Madras took this game seriously and students trained there have taken the game to other parts of the country. Volleyball has developed into a highly competitive sport which requires a high level of physical, physiological and psychological fitness. The game at a high level of competition requires quicker sudden movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched. (Indu Ramchandani, 2000)

Every player must know the requirements of his position and skills and he fits in with other members of the team, especially with those most closely connected with him. So a player must possess the skills of the game and should be physically fit to execute the same. If any of the above is lacking he is not a complete player. (Bonnie Kenny and Cindy Gregory, 2006)

Verducci (1980) believes "one of the major objectives of physical education is the development of sports skills" To determine if this objective has been met a measurement tool is needed. The evaluation of volleyball ability is typically measured by the administration of one or more individual skill tests.

Volleyball is an intermittent sport that requires players to participate in frequent short bouts of high-intensity exercise, followed by periods of low-intensity activity (Kunstlinger, Ludwig, & Syegemann, 1987; Viitasalo et al., 1987).

The high intensity bouts of exercise, coupled with the total duration of the match (*90 min), requires players to have well-developed aerobic and anaerobic a lactic (ATP-CP) energy systems (Polglaze & Dawson, 1992; Viitasalo et al., 1987).

Considerable demands are also placed on the neuromuscular system during the various sprints, jumps (blocking and spiking), and high-intensity court movement that occurs repeatedly during competition (Hosler, Morrow, & Jackson, 1978).

Plyometric is the term now applied to exercise‟s that have their roots in Europe, where they were first known simply as "jump training". Interest in this jump training increased during the early 1970s as East European athletes emerged as powers on the world sport scene. As the Eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics, and weightlifting, the mystique of their success began to center on their training methods. (Donald, 1992).

Plyometrics involve maximal muscle contractions at the highest velocity possible. By using this type of training properly, physical performance can be improved. The purpose of plyometric training is to decrease the ground contact time of an athlete while sprinting, jumping, or kicking. Ground contact time can simply be seen as the phase of time that elapses while the eccentric contraction (stretch) of a muscle group is reversed and the concentric contraction (contract) of that group begins (Chu, 1992).

“Yoga is a methodized effort towards self-perfection of the potentialities latent in the being and union of the human individual with the universal and transcendental existence which we see partially expressed in man and in the cosmos” (B.K.S.Iyengar 1983).

Asanas and physical exercises enable the body to be physically fit. These exercises play an important part in helping the pupils to maintain a slim and youthful body. Several tests and experiments have been conducted to know the values and importance of asanas. The most important point to realize before the practice of yoga is that, the asanas are not just simple exercise but sustained scientific pattern of postures, (K. Chandrasekaran, 1999).a universally benefits all people of all ages. Excellent performance in any sports is governed by several factors of physical fitness. The important one may be mentioned as speed, strength, stamina, suppleness, stability and neuromuscular co-ordination. Although not many scientific researchers have been done, the works of Herbet A. Devries (1961a,1961b, 1962), Gharote (1964,1976), Dhanaraj (1974), Giri (1966), Gharote and Ganguly (1976) have shown enough evidence about how yoga could be gain fully employed in the promotion of basic fitness factor using elaborate Fleishman Battery basic fitness test, Gharote (1974) has shown how even short term Yogic training could improve different basic fitness factors.

STATEMENT OF THE PROBLEM:

The purpose of the study is to investigate the "Effect Of Yogic And Plyometric Training On Selected Physical, Physiological And Performance Variables Among Male Volleyball Players Of Goa"

The second purpose of the study was to identify the superiority of the trainings on the selected variables among school level volleyball players. The game volleyball requires physical, physiological, psychological and skill performance variables to excel in the competitions. The player can be given training programs and thereby enhance their volleyball playing ability. For this purpose, the present investigation tries to find out the training "Effect of Yoga and Plyometric Training on selected Physical fitness variables,Physiological variables and Performance variables of male volleyball players from Goa"

REVIEW OF THE LITERATURE:

The research scholar has made every possible effort to go through the literature related to the problems in the game of Volleyball wherever available. The scholar has gleaned through almost every source like research quarterly, journal of various kinds, periodicals, encyclopaedia, relevant books and e-resources on Volleyball to pick up the related materials. While going through the various sources of literature, it has been observed that very little work has been done on Volleyball. However, the scholar has gone through the literature of allied studies that are related with other games and sports to collect the necessary information. Some of the review of literature have been give below:

Dhungel et.al (2018) have conducted pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. The responses of alternate nostril breathing (ANB) the nadi sudhi pranayama on some cardio-respiratory functions were investigated in healthy young adults. The subjects performed ANB exercise (15 minutes every day in the morning) for four weeks. Cardio respiratory parameters were recorded before and after 4-weeks training period. A significant increment in peak expiratory flow rate (PEFR L/min) and pulse pressure (PP) was noted. Although systolic blood pressure (SBP) was decreased insignificantly, the decreases in pulse rate (PR), respiratory rate (RR), diastolic blood pressure (DBP) were significant. Results indicate that regular practice of ANB (nadisudhi) increases parasympathetic activity.

Ganguly and Gharote (2018) measured scores on the Harvard step test in a study involving clinically normal males of average age 26 years. The subjects were measured before and after a months of yoga training, which consisted of one hour yoga practice daily including asanas, kriyas (cleaning practices), pranayamas, bandhas (locks), mudras (seals) and meditation. It was found to be an average increase of 7.6 in the test score, from 78.6 to 86.2. This was a statistically significant change (0.05). One of the five subjects initially scoring in the high average category (05-79) remained in that category, while 3 move to the good category (80-89) and 1 to the excellent (90 and above) category. Four of the six subject initially good category after testing, while 2 moved to the excellent category.

Ashok, et al. (2012) studied the effect of combination of plyometric training and skill training on the development of jumping ability, anaerobic capacity and skill performance of Male volleyball

players, sixty male volleyball players (18-25 yrs) were selected from various colleges in Coimbatore District, Tamilnadu. The subjects were divided as the Experimental group-1 (n=20, PLYOSKILL group) performed the plyometric and skill training, Experimental group-2 (n=20; SKILL group) performed the Skill Training alone, Experimental group:-3 (n=20, CONTROL group) did not perform any training. Pre-test values of jumping ability, anaerobic capacity and playing ability were 14.3± .69, 780.9 ± 54.12, 4.6 ± .59, for PLYOSKILL group, 14.27± .69, 780.9 ± 54.1, 4.6 ± .59 for Skill group and 14.27± .67, 780.95 ± 52.9, 4.7±.656 for Control group respectively. After 12 week of training programme the physical variables and playing ability were significantly improved at (P<=0.05 level). The post test values of jumping ability, anaerobic capacity and game playing ability were 16.4 ± .59, 818.2 ± 44.2, 6.7± .55 for PLYOSKILL group, 15.02 ± .59, 800.2 ± 28.25, 6.0± .72 for skill group and 14.22 ± .73, 775.80 ±49.47, 4.75± .638 for control group respectively. The study shows that combination of plyometric training and skill training were significantly developed jumping ability, anaerobic capacity and skill performance variables among male volleyball players.

Roopchand & Lue (2010) investigated the effect of a three week plyometric training programme on jump performance and agility in Jamaican national netball players. Eighteen national netballers participated in a Plyometric training programme. Subjects were evaluated using the Vertical Jump Test, the Broad Jump Test and the Illinois Agility Test prior to the start of the programme and at week 3. The data were analysed using SPSS version 12 for Windows. A One-Sample Kolmogorov-Smirnov Test showed normal distribution of data and a paired samples t-test was used to determine whether the mean change in jump performance and agility was significant. All eighteen subjects completed the three weeks of training. Three subjects were shown to be outliers at week 3 and this resulted in data from 15 subjects being analysed. At the end of the three weeks, there were significant improvements in Vertical Jump Scores ($p = 0.023$), Broad Jump Scores ($p = 0.002$) and Agility scores ($p = 0.045$). Three weeks of Plyometric training can lead to significant improvements in jump performance and agility and should be integrated into the national training programme at intervals yet to be determined.

SIGNIFICANCE OF THE STUDY:

1. This study will help to assess the physiological, bio-chemical and performance variables among 16-21 years men Volleyball Players of Goa.

2. The result of the study will help to introduce the training packages for men Volleyball players of Goa.
3. The result of the study will motivate the players to practice the game Volleyball.
4. The study will contribute to increase the knowledge and importance of physical fitness amongst the players.
5. The study will also be helpful to coaches and physical education teachers while designing and planning their training programs.
6. This study will be useful to the physical education teacher and Volleyball coach attempting to distinguish different playing levels among individual players .
7. Sports skill tests will be used for classification of teams, diagnosis, motivation, practice, and program accountability. These are all noteworthy goals which could be enhanced with an accurate assessment of the worth of Sports skills tests.

OBJECTIVES OF THE STUDY:

The researcher selected the work with a view to serve the following purposes.

1. To measure and assess effect of Yogic and Plyometric training on selected physical variables such as Speed, Leg Explosive Power, Cardio- Respiratory Endurance, Flexibility of male volleyball players from Goa.
2. To measure and assess effect of Yogic and Plyometric training on physiological parameters such as Resting Systolic Blood pressure, Resting Diastolic, Blood pressure, Red Blood Cells (RBC), White Blood Cells (WBC), Platelets of male volleyball players from Goa.
3. To measure and assess effect of Yogic and Plyometric training on Performance variables such as volleyball passing test, volleyball serving test and volleyball spiking test of male volleyball players from Goa.

HYPOTHESIS:

The following hypotheses has been made by the researcher for his study:

H1: There will be significance difference between effect of plyometric training on selected physical fitness, physiological parameters and performance variables of male volleyball players of Goa.

H1: There will be significance difference between effect of Yogic training on selected physical fitness, physiological parameters and performance variables of male volleyball players of Goa.

LIMITATION OF THE STUDY:

This study was limited to the following aspects.

1. The impact of training schedules, previous experiences, motivational factors and various physical activities on the subject‟s playing ability were not taken into account.
2. Hereditary and environmental factor, which contribute to both physical and mental efficiency will not be controlled.
3. No attempt will be make to determine whether the subjects and having the some degree of motivation during the various stages of training and testing periods.
4. Variations in performance due to diet, climatic conditions, ground conditions and other environmental factors that might affect the study, were not taken into consideration.
5. Since the human elements are involved in the test administration even slight error in measurement and timings which might affect the results were also considered as limitations of the study.
6. The fatigue factors of the players and the carryover knowledge of the skills which might affect the performance in the tests were considered as limitations of the study.

DELIMITATION OF THE STUDY:

Following are the delimitations of the study,

1. The study will be delimited to male Volleyball players of Goa
2. The age of the Volleyball players between 16 to 21 years only.
3. The study will be delimited to 60 male volleyball players of Goa only.
4. The study will be delimited to Physiological parameters such as Resting Systolic Blood pressure, Resting Diastolic, Blood pressure, Red Blood Cells (RBC), White Blood Cells (WBC), Platelets, etc.
5. The study will be delimited to Physical Fitness components such as Speed, Leg Explosive Power, Cardio- Respiratory Endurance, Flexibility, etc
6. The study will be delimited to Skill performance tests such as volleyball passing test, volleyball serving test and volleyball spiking test.

OPERATIONAL DEFINITION AND EXPLANATION OF THE TERM:

1. **Yogic Practices:** Yogic practice package refers to a set of yogic techniques (asana, pranayama and meditation) that are completed sequentially (one exercise after another). Each exercise is performed: slow, relaxed, and rhythmic and with total awareness for a specific period.
2. **Physical Fitness:** Physical fitness refers to the capacity of an athlete to meet the varied physical demands of their sport without reducing the athlete to a fatigued state.
3. **Muscular Strength:** Muscular strength is one element of normal physical fitness. It is a maximal contraction power of the muscle. It is usually measured with respect to individual group of muscles acting together.
4. **Leg Explosive Power:** Leg Explosive Power is a component of motor fitness. It is strength to disburse highest muscle power rapidly in a fiery way in the short time.
5. **Cardio-vascular Endurance:** This is the core factor of general physical fitness. This is also called cardiopulmonary or circulatory, Respiratory endurance. It is the ability to carry burly work at semi maximal level by rational shrivelling for more time.
6. **Agility:** According to Elizabeth, (2007) agility is the ability to move and change direction and position of the body quickly and effectively while under control.
7. **Speed:** Speed is the rapidity with which a movement or successive movements of the same kind may be performed by an individual.
8. **Flexibility:** A person's flexibility refers to the ability of his joints to move through a full range of motion. (Paige, 2008).
9. **Systolic blood pressure:** Systolic blood pressure is the pressure in the heart and blood vessels during contraction phase of the cardiac cycle. This is the highest level to which the arterial blood pressure rises following the systolic ejection of blood from the left ventricle. (Morehouse et.al., 1971).
10. **Diastolic blood pressure:** Diastolic blood pressure is the minimum level of arterial blood pressure falls in the time between successive heart beats. This is the lowest level in which arterial blood pressure falls in between the successive heartbeat. (Morehouse et.al., 1971).
11. **RBC:** Red blood cells or erythrocytes, are the most common type of blood cell and the vertebrate organism's principal means of delivering oxygen (O2) to the body tissues via the blood flow through the circulatory system (Fox, et al. 1993).
12. **WBC:** White blood cells or leukocytes are cells of the immune system involved in defending the body against both infectious disease and foreign materials (Fox, et.al. 1993).

13. **Platelets:** Platelets or thrombocytes, are small, irregularly shaped clear cell fragments 2-3 um in diameter, which are derived from fragmentation of precursor megakaryocytic (Fox, et al. 1993).

METHOD:

For this researchExperimental method will be used as the methodology of the study. The purpose of the study.

Pilot Study

A pilot study was conducted with the expert to assess the initial capacity of the subjects in order to fix the load. For this, twelve volleyball players were selected at random from the selected subjects and divided into two groups of six each, in which group-I underwent Plyometric training and group-II performed yogic practices combined with Plyometric training under watchful eyes of the experts and the investigator. Based on the responses of the subjects in the pilot study the training schedule for both the groups were constructed.

SAMPLING:

Population:

male Volleyball Players of Goa between the age group of 16- 21 years who have been playing Volleyball for the past Four years.

Sample:

The purpose of the study was to find out the effect of plyometric and Yogic Training on selected Physical fitness variables, physiological and performance variables among male Volleyball players. To achieve the purpose of the present study, N-60 male Volleyball players from Goa, India were selected as subjects at random and their ages ranged from 16 to 21 years. The subjects were divided into three equal groups of Twenty subjects each. Group I acted as Experimental Group I (Plyometric Training), Group II acted as Experimental Group II (Plyometric and Yogic Training) and Group III acted as Control Group. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study.

Sampling technique: simple random sampling techniques will be used for selecting the sample of the study.

Variables of the study:

Sr. No.	Variables	Test	Measuring Unit
1	Cardiovascular Endurance	12 min run/walk	Minutes
3	Flexibility	Sit and reach test	Meters
4	Agility	4X10 mts. Shuttle run	Minutes
5	Muscular Power	Standing Broad jump	Meters
6	Resting Systolic Blood pressure	Sphygmomanomete	Mm/bg
7	Resting Diastolic Blod Pressure	Sphygmomanometer	Mm/bg
8	Red Blood Cells	Blood Test	In mill./cu.mm
9	White Blood Cells	Blood Test	In cu.mm
10	Platelets	Blood Test	In Lakhs/Cu.mm
11	Volleyball Passing	Russell - Lange Volleyball test (Repeated Volleyball pass Test)	Scores
12	Volleyball service Ability	Russell - Lange Serving Test	Scores
13	Volleyball spiking	Helmen Volleyball Test (1971-73)	Scores

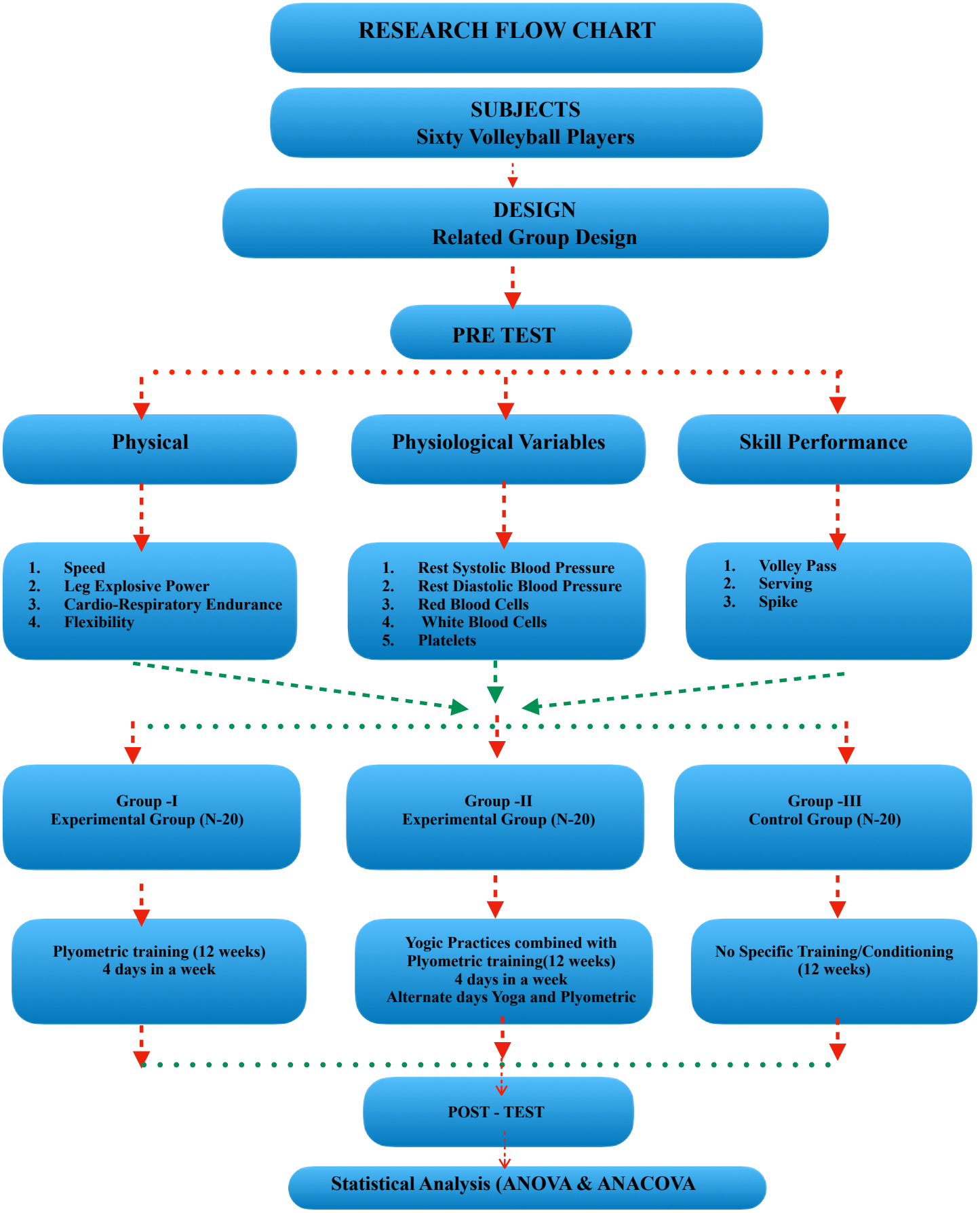
YOGA PRACTISE PLAN:

	Yogic Practise	**Name**		**Duration**
1	Asanas	1	Padmasana	20 Min
		2	Vajrasana	
		3	Bhujangasana	
		4	Chakarasana	
		5	Trikonasana	
		6	Tadasana	
2	Pranayama	1	Kapalbhathi	15 min
		2	Bhramari	

PLYOMETRIC TRAINING PLAN:

Week & Session	Intensity (%)	Exercises	Repetitions	Sets	Recovery
1- 4	50-60%	1.Squat Jump 2.Tuck Jump 3.Depth Jump 4.Medicine Ball Overhead Throw 5.T Hop Drill	10	3 sets	2-3 Min
5 - 8	60-70%	1.Squat Throws 2.Ankle Hops 3.Ricochets 4.Lateral Box Jump 5.T Hop Drill 6.Explosive Push Ups	8	3 sets	3 Min
9-12	70-80%	1.Short high-speed sprints 2.Agility ladder 3.Step hurdles 4.Lateral/side stepper 5.Dot drills 6.Short Sprints	6	3 sets	3-4 Min

DESIGN:


RESEARCH FLOW CHART
SUBJECTS
Sixty Volleyball Players
DESIGN
Related Group Design
PRE TEST
Physical
Physiological Variables
Skill Performance
1. Speed
2. Leg Explosive Power
3. Cardio-Respiratory Endurance
4. Flexibility
1. Rest Systolic Blood Pressure
2. Rest Diastolic Blood Pressure
3. Red Blood Cells
4. White Blood Cells
5. Platelets
1. Volley Pass
2. Serving
3. Spike
Group -I
Experimental Group (N-20)
Group -II
Experimental Group (N-20)
Group -III
Control Group (N-20)
Plyometric training (12 weeks)
4 days in a week
Yogic Practices combined with
Plyometric training(12 weeks)
4 days in a week
Alternate days Yoga and Plyometric
No Specific Training/Conditioning
(12 weeks)
POST - TEST
Statistical Analysis (ANOVA & ANACOVA

TOOLS FOR DATA COLLECTION:

- In this study the researcher will use 50 mtr dash, 4X10 mtr. shuttle run, Sit and reach, standing broad jump, Vertical jump, 600 yards walk/run test items to measure physical fitness.
- Physiological Variables would be analysed through blood testing and Sphygmomanometer.
- With the help of Volleyball, Chalks, Brick Wall Performance variables would be calculated.

- **PROCEDURE:**

  - First, the researcher will select the sample for the study.
  - The players which are selected by researcher will their physiological variable tested such as Rest Systolic Blood Pressure, Rest Diastolic Blood Pressure, Red Blood Cells, White Blood Cells and Platelets.
  - Similarly to analyse physical fitness various tests will taken on them such as for speed- 50 mtr. dash, Agility- 4X10 mtr. Shuttle run, Flexibility- Sit and Reach, Muscular strength- Standing Broad jump,Cardio-vascular endurance- 12 min run/walk etc.
  - Similarly to analyse Skill performance Russel-Lange volleyball passing and serving test and Helmens spike test will be taken.
  - For the collected score, ANOVA, ANCOVA, Scheffe's Post Hoc will be used to find out the conclusion.

STATISTICAL TOOL:

The statistical tool used for these are:

Analysis of Co- Variance (ANCOVA) Will be used to compare mean score between the groups by keeping pre test as Co-variates.

Scheffe's Post- hoc test will be used to test the significance of difference of pairs of adjusted final group means to find out the better group

REFERENCES:

- **A**ndre van Lysebeth, (1987) "Yoga self Taught", Delhi : Tarage publishers, p.17.
- Barry, Johnson L. and Nelson K. Jack (1982) "Practical Measurements for Evaluation in Physical Education", Delhi: Surjeet publications, P. 56.
- Baumgartner Ted. A and Andrew S. Jackson, (1987) "Practical Measurements for Evaluation in Physical Education and Exercise Science" (3rd ed), Dubeque, Lowa : WMC. Brown publishers, P.287.
- Bhargava, R. Gogate, M.G. and Mascarenhas, J.F. "Autonomic responses to breath holding and its variations following pranayama". Dissertation abstract international 32(4):257-64, 2018.
- Baechle, T.R. (1994). Essentials of Strength Training and Conditioning.Champaign, IL: Human Kinetics.
- Chu, D. (1992). Jumping into Plyometrics. Champaign, IL: Human Kinetics.
- Lee, E. B,, Vance, A. F. & Juan, C. S. (2000). Training for Speed, Agility and Quickness. USA.
- Anthony, A. A. (1972). Development conditioning for physical Education and Athletics. Saint Louis: The C.V Mosby Company, P.32.
- Dhungel K. Upadhyay, Malhotra V. Sarkar D. and Prajapati R. "Effect of alternate nostril breathing exercise on cardio respiratory functions". Nepal Medical College Journal 10(1):25-27, 2018.
- Fox, Edward L, and Browers (1989) "The Physiological basis of Physical Education and Athletics", (4th ed), Lowa : WMC Brown Publishers
- PP.147-149.
- Ganguly, S.K. and Gharote, M.L. "Cardiovascular efficiency before and after yogic training". Yoga mimamsa 7:1, 2018.
- Garden Jackson (1985) "A Family Guide to Fitness and Exercises", London : Salemander Books Ltd.
- Green, Jerrold S. and Pargman (1986) "Physical Fitness-A Wellness Approach", Saint Louis : Times Mirror/Mosby College Publishing. PP. 35-45.
- Hardayal Singh (1991) "Sports training General, theory and methods", Patiala : Nethaji Subhash National Institute of sports PP 44-48.
- Jackson & Baker (1987) "Measurement for Evaluation in Physical Education and Exercise Science", 3rd (ed) Dubuque, Lower : W M C Brown Publishers.

- Johnson & Nelson,(1986) “Practical Measurements for Evaluation in Physical Education’s”, New Delhi : Surjith Publications, P.56.
- Jyothi, K. Mangaiyakarasi, S. and Sabha, Anand S. “comparative effect of Bharathanatyam and Asana on the flexibility among college students”. Research Bio-Annual for movement. 28(1):36-44, 2015.
- Kaur, Kuljit; Sharma, P.Nagendra, and Dureha, K.Dilip.,(2014). “The relationship between achievement motivation and pre competition anxiety of Indian inter-university hockey players”. Science journal in sport and exercise, Vol.3 No2.Dec 2014.
- 222
- Lepicovska,V. Dostalek and C, Kovarova. “Hathayogic exercise jalandharabandha in its effect on cardiovascular response to apnoea”. Activita Nervosa Superior (Praha) 32(2):99-114, 2016.
- Lewis, C.L. and M.A., Frgak-Pinkam. “Effects of aerobic conditioning and strength training on a child with Down syndrome: a case study”. Pediatric Physical Therapy17 (1):30-36, 2017.
- Martens Rainer, (1997) “Coaches Guide to Sports Psychology”, Illinois : Human Kinetics Publishers Inc, P.109.
- Miller (1976) “Physiology of Exercise”, St.Louis: The C.V.Mosby Company, P.15.
- Miller Benjamin F, (1965) “The Modern Medical Encyclopedia”, New York : Golden Press.
- Miller David K (1994) “Measurement by Physical Educator, Why and How” 2nd (ed) Dubuque, Lower : W M C Brown Publishers.P.31
- New Webster’s Dictionary (1968) Delhi: Surjith Publications, P.283
- O’Connor, E J; Raglin, J. S. and Martinsen, E. W., (2010). “Physical activity, anxiety and anxiety disorders”. International Journal of Sport Psychology, (31), 136-155.

(Aaron Avelino Pereira)
(Researcher Scholar)

(Dr. Ramesh Kadam)
(Rajiv Gandhi Mahavidyalaya, Mukhed)
(Research Guide)